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In view of the previous remarks, it seems reasonable to adopt as a goal with reference to this question the proof that if the equation holds for some range of the variable h, the function $f(x)$ can be only a polynomial of degree $\leqq 3$, under restrictions as light as possible—*e.g.*, that $f(x)$ should be continuous and possess a stated number (as small as it can be made) of derivatives.

DISCUSSIONS.

In the study of a geometric locus, it is frequently useful to have an analytic form of representation which shall exhibit the properties of the locus as regards its size and shape, without reference to its position. Such a form of representation, in the case of a plane curve, is furnished by the *intrinsic equation* of the curve —the functional relation which subsists between the length of arc measured from a fixed point of the curve to a variable point, and the radius of curvature at the variable point. Professor Light makes use of the intrinsic equation to study curves whose evolutes are similar to themselves. He obtains only the cases already known—the logarithmic spiral, and the cycloidal curves, and shows that no other examples exist whose intrinsic equations are of the special type $AR^n + BS^m - C = 0$. It would be of interest to know whether any other curves whatever can have this property.

In this department for May appeared a derivation of the formulæ for the tangents of the half angles of a triangle from the law of sines, by Professor Baudin, In the present number Professor Bohannan gives a method of obtaining tangent, sine and cosine of the half-angles by a geometric proof based on the use of inscribed and escribed circles.

Professor Poor recommends the more extensive use of directed lines and the method of projection in connection with elementary analytic geometry. In fact the use of such notions in the class-room is perhaps more prevalent than their appearance in text-books might indicate. Even in text-books however they are to be found here and there. The theorems stated by Professor Poor are now generally used in trigonometry to prove the formulæ for sines and cosines of sums and differences of angles. In some texts on analytic geometry they form the only mode of approach to transformation of coördinates by rotation; and they are frequently used in just the fashion suggested by Professor Poor to obtain the normal form of the equation of a straight line.

I. Note on Curves Whose Evolutes are Similar Curves.

By G. H. Light, University of Colorado.

It is known[1] that the evolutes of certain curves are similar curves. It is the purpose of this paper to give the general conditions that must be satisfied by

[1] Euler: "Investigatio curvarum quae evolutae sui similes producunt," *Comm. Petrop.* vol. 12, 1750, pp. 19–23.
Loria: *Spezielle algebraische und transcendente ebene Kurven*, Leipzig, 1902, p. 625.
Cesàro, *Vorlesungen über naturliche Geometrie*, Leipzig, 1901, pp. 36–37.